NORTEL

Position Paper

SIP trunking: The what, how and why

SIP trunks can offer significant cost-savings and eliminate the need for local PSTN gateways and expensive Primary Rate Interfaces (PRIs) while simplifying your Unified Communications (UC) environment.

Session Initiation Protocol (SIP) has emerged as the universal blueprint for IP Telephony and unified communications in general. By supporting a wide range of media sessions, SIP allows users to engage in anytime-anywhere integrated business communications regardless of location, media type or device. For enterprises, the benefits of SIP can be significant — accelerated business communications, improved information transfer and file sharing, enhanced worker productivity through conferencing and collaboration capabilities, and reduced mobile phone costs through the use of soft clients remotely.

From an IP Telephony perspective, SIP trunking technology can open the door to significant cost savings, while delivering exceptional voice quality and robust features and capabilities. Nortel not only offers products that are SIP-ready and SIP-upgradeable, but can also help your enterprise reap the immediate and downstream benefits that SIP enables.

This position paper provides an introduction to SIP trunking and why it provides a compelling alternative to more traditional, yet less flexible ISDN-PRI digital trunking solutions.

ISDN-PRI digital trunk connections are the evolution of T1 into ISDN. With the deployment of broadband services on a global scale, there is now an opportunity to deliver trunks in Voice over IP (VoIP) over broadband. The prevalent protocol for delivering the signal associated with those trunks is SIP.

SIP and IP Telephony

SIP trunking — a connection offered by an Internet Telephony Service Provider (ITSP) — connects an enterprise's PBX to the existing telephone system infrastructure (Public Switched Telephone Network) via Internet using the SIP VoIP standard.

As a logical rather than a physical connection, SIP trunking delivers the benefit of having no limit on the number of calls that can be carried over a single trunk. Each call consumes a certain amount of network bandwidth, so the number of calls is only limited by the amount of bandwidth that can flow between the IP PBX and the ITSP's equipment. Unlike traditional telephony, where physical wires were once delivered from the service provider to a business, a SIP trunk allows companies to replace traditional fixed PSTN lines with PSTN connectivity via a SIP trunking service provider on the Internet.

Recently, many Internet Service Providers (ISPs) have decided to compete with carriers and offer SIP trunking service over broadband in competition to T1 digital ISDN interfaces. Now carriers are following suit, by offering SIP trunking as a way to deliver incoming calls from the outside world into telephone switches.

One could say that SIP is to VoIP as HTTP is to the web browsers and servers. Whereas HTTP is the signaling protocol that describes the data viewed in a web browser, SIP allows the IP PBX or telephone set to signal that it wants to connect to another phone and communicate voice between the two points.

SIP enables two parties to communicate in a web-centric way. The end points of a SIP communication are called SIP user agents. These agents can include a range of devices and applications; for example, a telephone set, an IP softphone, instant messaging client, video terminal, customer relationship management application, and plug-ins for Microsoft and IBM desktop environments.

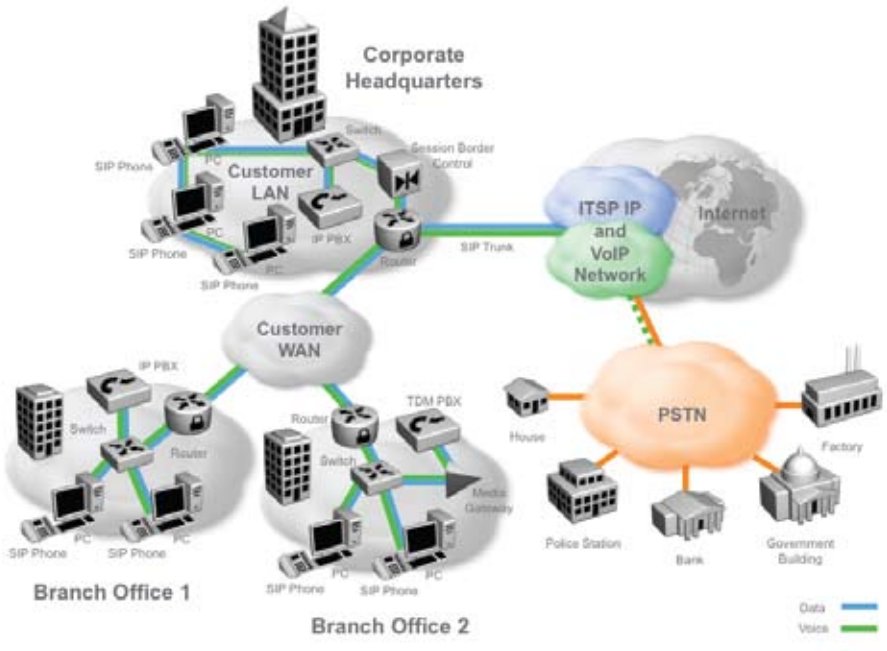
Unlike Q.931 signaling and ISDN, SIP is a text-based protocol, and can be easily understood, designed and scaled. SIP is an Internet Engineering Task Force (IETF) standard and based on Request For Comments (RFCs) that have been recognized and accepted by the industry. SIP also extends out to mobile devices. Business takes place everywhere — whether it's across buildings, countries or continents. Whether individuals are in their offices, in transit or working from remote locations, SIP enables the communication that unites people, devices and applications.

SIP has emerged as the protocol winner. Now what?

For companies that want to make optimal use of existing IP PBXs and not only communicate over IP within the enterprise, but also outside the enterprise, a SIP trunk that connects to the traditional PSTN network is the solution.

SIP trunks establish the foundation for an end-to-end IP environment where business communications can be dynamic, efficient and virtually seamless. Transition to SIP trunking can take place gradually over time, eliminating the need for the enterprise to upgrade all of its technology at one time.

Figure 1. Centralized SIP trunking network



NOTE: This diagram represents one possible SIP trunking network scenario and has been included for illustration purposes only. The Session Border Controller (SBC) can also be hosted by the ITSP on behalf of the enterprise business.

The best advice? Do your homework.

Does the carrier with whom you currently do business have what it takes to meet your requirements? For example, does the carrier have a proven solution that's currently deployed in the market? Do they work closely with their equipment suppliers/manufacturers to ensure an end-to-end solution that eliminates concerns about security, E911, interoperability, reliability, survivability and Quality of Service issues?

Moreover, savings realized by the move to SIP can be used to finance future investments as customers evolve to a UC-centric environment.

A SIP trunking checklist

If you currently use traditional PBX equipment and want to upgrade your network to take advantage of all the cost savings of SIP as well as other benefits, including enhanced workplace productivity, faster time to decision making and elevated levels of customer service, here are some things you should consider:

1. Examine your network requirements

How many PRI and IP trunks do you currently have within your network infrastructure? How many users do you have and what are your bandwidth/traffic requirements? Based on this analysis, determine how many trunks you can consolidate.

2. Connect with your carrier to assess your network readiness

Examine the service charge and service fees you incur to address your current bandwidth requirements. Find out if the carrier can provide SIP trunking for your current Nortel CPE-based solutions (i.e., the Nortel Communication Server 1000, Communication Server 2100, Software Communication System, and Business Communications Manager 50/450). Most major carriers, including Sprint and Verizon, support Nortel solution sets which can be easily migrated to SIP.

3. Determine your migration path

Do you need software upgrades to become SIP-ready? Note: Where hardware adjustments or additions may be required, your carrier can work with you to identify them.

4. Install required software

Work with your equipment vendor to make the necessary software upgrades.

5. Begin realizing the benefits of SIP

The SIP trunking advantage

Cost savings without compromising quality

The cost savings that can be achieved by having SIP trunking over broadband services can be significant. For local calls; for example, access costs for analog are $50 per line, while T1 can be as much as $1,200 per month and the broadband interface $50 per month. Add service costs to the equation, and the monthly tab can be enormous. And that's just the beginning.

For long distance, the cost of getting a long-distance plan is a fraction of what it would cost for going through digital interfaces via a regular carrier. For more information refer to the next section, "Business Cases for SIP Trunking".

Access to robust features that enhance productivity

SIP trunking is ideal for providing centralized voicemail, auto attendant, name and number display, and numerous other capabilities, which can result in higher productivity, less wasted time and elevated levels of customer service.

Survivability to ensure business as usual

Connectivity between your remote sites and network can be lost without warning. In the event that a location is cut off, for example, a fiber is mistakenly cut, SIP trunking failover capabilities take over, rerouting calls to another site. This function ensures that calls can still be made even if the ITSP's connection goes down.

Security

As the lines blur between internal and external resources, the network reaches more audiences and touch points, carries more mission-critical services, and adds more distributed servers and client devices. Organizations have been understandably concerned about securing this new IP environment where proprietary information flows across shared facilities, public places, open airwaves and unknown users. Perceived security issues with SIP trunking pertaining to network access translation, signaling traffic encryption, firewalls, E911 etc. are overcome when you choose ITSPs and IP Telephony/UC Solutions Providers that have worked together to 'certify' interoperability.

Global presence without the high cost of long distance

If you have SIP trunking and broadband access to the Internet, you have the ability to subscribe to SIP trunking with service providers around the world. For example, if you have to conduct

business in Munich, you can request a local number from the service provider. When a person calls the number in Munich, the telephone rings in North America, and you essentially become a 'global' company, without incurring the high costs of long distance. Additionally, you now have the opportunity to subscribe to more competitive telephony services as well as incremental services.

Two business cases for SIP trunking

Recently, Nortel partnered with a leading carrier to provide SIP trunking solutions to two enterprise customers. Here are the tangible and significant results.

CASE 1: Financial Services Institution

Prior to deploying a SIP trunking solution, the voice network for this financial services company was comprised of 16 call servers strategically placed throughout the organization's nationwide network. To support some 13,000 users and their local and long distance calling needs, the network included voice traffic traversing T1s in each location with a total of 61 T1s overall. Utilization of the company's PRI/T1 was approximately 70 to 75 percent.

Assumptions

- Monthly PRI access fee = $500 (includes local access fee)
- Conversion: 1 T1/E1 (PRI) trunk = 23 SIP trunks (channels)
- Fee for 1 SIP trunk = $20/month per connection
- Long distance fee = $0.05/minute

Analysis

Number of PRIs installed	PRI utilization rate	Number of PRIs required	Number of unused PRIs	Cost of unused PRIs/ month	Cost of unused PRIs/ Year
61	75%	46	15	$7,625	$91,500

	PRI/month	SIP Trunk/ month	Savings/ month	Savings/year
PRI access fees	$ 30,500	$ 28,060	$ 2,440	$ 20,280
Long distance fees	$ 10,000	–	$ 10,000	$ 120,000

Savings

Total savings/month	**$ 20,065**
Total savings/year	**$ 240,780**

CASE 2: Regional Government

This county government provides voice and data services to its staff and constituents using optical, data and voice equipment. The voice network is comprised of 11 call servers strategically placed throughout the county's footprint, which supports 4,000 users.

Assumptions

- 13 T1/E1 (PRI) trunks
- Monthly PRI access fee = $500 (includes local access fee)
- Conversion: 1 T1/E1 (PRI) trunk = 23 SIP trunks (channels)
- Fee for 1 SIP trunk = $20/month per connection
- Long distance fee = $0.05/minute
- Utilization = 70%

Analysis

Number of PRIs installed	PRI utilization rate	Number of PRIs required	Number of unused PRIs	Cost of unused PRIs/ month	Cost of unused PRIs/ Year
13	70%	9	9	$ 1,950	$23,400

	PRI/month	SIP Trunk/ month	Savings/ month	Savings/year
PRI access fees	$ 6,500	$ 5,980	$ 520	$ 6,240
Long distance fees	$ 350	–	$ 350	$ 4,200

Savings

Total savings/month	**$ 2,820**
Total savings/year	**$ 33,840**

Nortel: Championing SIP

A long-time leader in providing communications solutions to companies around the world, Nortel recognizes the value that SIP can bring to businesses. Working closely with other industry leaders, including Microsoft, IBM and Dell, Nortel has been a driving force in developing and implementing the SIP-based solutions that change how businesses communicate.

Nortel has opened up its industry-standard SIP interfaces to partner programs SIP CTI — to deliver virtually seamless unified communications solutions and an accelerated faster time to market. Enterprises can use an all-Nortel solution or choose best-in-class interworking with industry leaders such as Microsoft, integrating all solutions together with the SOA web interfaces.

The Nortel Agile Communication Environment leverages Service-Oriented Architecture (SOA) and Web Services to facilitate the development of Communications Enabled Applications (CEA) and business processes (CEBP), which are key to addressing the challenge of hyperconnectivity. It works with both Nortel equipment (e.g., PBXs and soft switches), and those of other vendors, and is future-proof for next-generation switches.

Appendix A. Nortel IP Telephony platforms

Nortel IP Telephony platform	Number of users	Description
Business Communications Manager 50/450	Up to 300 stations	An IP-enabled communication system with advanced UC applications and features – integrates voice and data functions into a single box for small- to mid-sized business or multi-site and branch offices.
Communication Server 1000	Up to 22,500 stations	Highly scalable, robust and fully redundant IP communications system that extends an industry-leading set of IP applications to many thousands of users.
Communication Server 2100	Up to 200,000 stations	The first carrier-grade, IP softswitch for large campuses and geographically dispersed large enterprises.
Multimedia Communication Server 5100	Up to 20,000 active users	Delivers advanced IP-based capabilities such as multimedia (video conferencing and calling, visual caller ID); collaboration (conferencing, white boarding, file exchange, co-Web browsing); personalization (call screening, call logs, call management and routing - find me, follow me); presence and instant messaging.
Software Communication System	Up to 2000 with 1 server, or several thousands with multiple servers	SCS is a completely open-standards-based (SIP) software UC solution that has been developed using a Services Oriented Architecture (SOA) approach for communications integration with different web-based applications. SCS is supported on a variety of industry-standard hardware platforms. The SCS solution offers integrated and robust UC capabilities — simple enough for SMBs yet sophisticated enough for large distributed enterprise deployments.

Nortel is a recognized leader in delivering communications capabilities that enhance the human experience, ignite and power global commerce, and secure and protect the world's most critical information. Serving both service provider and enterprise customers, Nortel delivers innovative technology solutions that encompass end-to-end broadband VoIP, multimedia services and applications, and wireless broadband designed to help people solve the world's greatest challenges. Nortel does business in more than 150 countries. For more information, visit Nortel at www.nortel.com or contact your Nortel representative.

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